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Data in the MSMR are provisional, based on reports and other sources of data available to the Army Medical Surveillance Activity (AMSA). Notifiable events are reported by date of onset (or date of notification when date of onset is absent). Only cases submitted as confirmed are included.

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Outbreak Report

Malaria among Members of an Inspection Team After a One-Week Mission to Central America, Fort McPherson, Georgia

In October 1999, a team of seven soldiers and civilians traveled to Honduras to conduct an inspection mission. All team members were experienced travelers and all had been to Central or South America previously. The team did not seek medical advice prior to its departure. This report describes an outbreak of malaria among the inspection team's members approximately four to six weeks after their return to the United States.

Case 1: On 11 November 1999, a 49-year-old male soldier experienced fever, chills, and headache. Four weeks prior he had been the inspection team's leader during their 1-week mission in Honduras. He treated himself with Motrin®, oral hydration, and rest. His symptoms resolved by the following morning but recurred that night. On the third day of his illness after another symptomatic episode, he presented to a civilian urgent care center. He reported his recent travel to Honduras and asked if he might have malaria. He was diagnosed with "the flu" and released. On the sixth day of recurrent episodes of progressively severe headaches, fevers to 104°F., and chills, he presented to the Lawrence Joel Army Health Clinic (LJAHC) at Fort McPherson, Georgia. His temperature was 103.7°F. oral and he had a positive finding on a tilt test. He reported no uses of antimalarial drugs until his third day in Honduras. At that time, he received doxycycline for chemoprophylaxis, which he took once a day for approximately one week.

At the LJAHC, the soldier was presumptively diagnosed with malaria and dehydration. He was given 2 liters of lactated Ringers solution and transported to a civilian hospital where he received another 3 liters of fluids. When his fever had subsided and after a single negative blood smear, he was told that he did not have malaria and was discharged from the emergency room.

On the seventh day of his illness, he returned to LJAHC and was started on a three-day course of chloroquine followed by a two-week course of primaquine. Serial blood smears were initiated. Two independent laboratories identified plasmodium ring forms, but the species could not be determined. The following day he was transferred to Eisenhower Army Medical Center, Fort Gordon, Georgia, for comfort care. A polymerase chain reaction assay performed at the Centers for Disease Control and

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Prevention, Atlanta, Georgia, identified *P. falciparum*. The soldier fully recovered over the next few weeks.

On the day of presentation of the first case to LJAHC, a civilian member of the inspection team reported that no one on the team had taken antimalarial chemoprophylaxis until their third day in Honduras. The other five members of the team were then contacted and advised to report (even if asymptomatic) to the nearest medical facility to begin usual post-exposure regimens of primaquine.

Case 2: On the evening of 17 November, a 55-year-old male civilian member of the Honduras inspection team experienced fever and chills. He received usual courses of chloroquine and primaquine and had no further symptoms. Serial blood smears identified plasmodium ring forms, but the species could not be confirmed. The species was presumed to be *P. vivax*, the predominant form in Honduras.[1]

Case 3: On 19 November, a 38-year-old male soldier who had been on the inspection team had plasmodium ring forms detected in a blood smear. The soldier was asymptomatic. The species was not determined but was presumed to be *P. vivax*.

At this point, courses of chloroquine and primaquine were prescribed for the remaining four team members.

Case 4: On 20 November, a 49-year-old male soldier who had been on the inspection team experienced fever and chills, which recurred for three days, followed by two weeks of fatigue. He had started chloroquine the day prior to the onset of symptoms. He presented to LJAHC after completing his chloroquine. No smears were performed. Malaria was diagnosed presumptively.

As a response to the outbreak, local travel policy was changed. Now all overseas travel orders must be cleared through the unit surgeon.

Editorial comment. This outbreak illuminates several important points regarding military medicine in general and malaria in particular.

First, even experienced military travelers should be counseled regarding medical threats and countermeasures prior to overseas missions. If possible, this counseling should be performed by medical professionals who are knowledgeable of, and up-to-date on, travel medicine.[2,3]

Second, even brief exposures to locations and settings of intense malaria transmission may result in high attack rates in susceptible groups. In this outbreak, nearly 60% of an inspection team's members were diagnosed with malaria after the completion of their mission. A comparable attack rate in a larger deployed force would have much greater medical and military operational consequences. Thus, malaria remains one of the most significant threats to military operations in endemic regions.[4-6]

Third, primary care providers, including civilian practitioners who serve military populations, should consider malaria in the differential diagnosis of all febrile military members with compatible clinical histories. Histories of travel to malarious areas should be solicited, and if appropriate, the diagnosis of malaria should be aggressively pursued.

Fourth, it is often difficult to confirm the diagnosis of malaria, particularly when parasitemia levels are low. In turn, malaria cannot be definitively ruled out until multiple properly prepared blood smears have been examined by knowledgeable and experienced microscopists.

Finally, medical personnel at all support levels (e.g., command surgeons, unit medics, troop medical clinic staffs)[6] should emphasize the importance of full compliance with prescribed postexposure chemoprophylactic regimens.

Report provided by Jonathan R. Greifer, CPT(P), MC, Aviation Medicine, Lawrence Joel Army Health Clinic, Fort McPherson, Georgia.

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Table I. Sentinel reportable events, US Army medical treatment facilities[1] Cumulative events for all beneficiaries, calendar years through January 31, 1999 and 2000[2]

Reporting Facility	Number of reported events[3]		Environmental				Food- and Water-borne							
			Cold		Heat		Campylobacter		Giardia		Salmonella		Shigella	
	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000
NORTH ATLANTIC RMC														
Walter Reed AMC, DC	29	4	-	-	-	-	1	-	-	-	-	-	-	-
Aberdeen Prov. Grd., MD	4	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Belvoir, VA	15	16	-	-	-	-	1	-	-	-	1	-	-	-
FT Bragg, NC	36	64	-	-	-	-	1	-	-	-	-	-	-	-
FT Drum, NY	10	11	-	-	-	-	-	-	-	-	-	-	-	-
FT Eustis, VA	18	10	-	-	-	-	-	-	-	-	-	-	-	-
FT Knox, KY	17	13	-	-	-	-	-	-	-	-	-	-	-	-
FT Lee, VA	24	2	-	-	-	-	-	-	-	-	-	-	-	-
FT Meade, MD	4	14	-	-	-	-	-	-	-	-	-	1	-	-
West Point, NY	2	-	-	-	-	-	-	-	-	-	-	-	-	-
GREAT PLAINS RMC														
Beaumont AMC, TX	-	16	-	-	-	-	-	-	-	-	-	-	-	-
Brooke AMC, TX	24	49	-	-	-	-	-	-	-	-	-	-	2	-
FT Carson, CO	50	20	-	-	-	-	-	-	-	-	-	-	-	-
FT Hood, TX	12	30	-	-	-	-	-	1	-	-	-	-	-	1
FT Huachuca, AZ	-	4	-	-	-	-	-	-	-	-	-	-	-	-
FT Leavenworth, KS	-	1	-	-	-	-	-	-	-	-	-	-	-	-
FT Leonard Wood, MO	23	16	1	3	-	-	-	-	-	-	-	-	-	-
FT Polk, LA	17	19	-	-	-	-	-	-	-	-	-	-	-	-
FT Riley, KS	15	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Sill, OK	34	-	-	-	-	-	-	-	-	-	-	-	-	-
SOUTHEAST RMC														
Eisenhower AMC, GA	21	7	-	-	-	-	-	-	-	-	-	-	-	-
FT Benning, GA	28	33	-	-	1	-	-	-	-	-	-	-	-	-
FT Campbell, KY	46	24	-	1	-	-	3	-	-	-	2	-	2	-
FT Jackson, SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Rucker, AL	3	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Stewart, GA	33	50	-	-	-	-	-	-	-	-	-	-	-	-
WESTERN RMC														
Madigan AMC, WA	68	65	-	-	-	-	-	-	-	-	-	-	-	1
FT Irwin, CA	-	1	-	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	14	3	7	2	-	-	-	-	-	-	-	-	-	-
OTHER LOCATIONS														
Tripler, HI	34	58	-	-	-	-	2	3	-	4	1	1	-	-
Europe	33	31	1	1	-	-	1	-	-	-	1	2	-	-
Korea	-	6	-	1	-	-	-	-	-	-	-	-	-	-
Total	**614**	**567**	**9**	**8**	**1**	**-**	**9**	**4**	**-**	**4**	**5**	**4**	**4**	**2**

1. Main and satellite clinics.
2. Events reported by February 7, 1999 and 2000.
3. Tri-Service Reportable Events, Version 1.0, July 1998.

Table I. (Cont'd) Sentinel reportable events, US Army medical treatment facilities[1] Cumulative events for all beneficiaries, calendar years through January 31, 1999 and 2000[2]

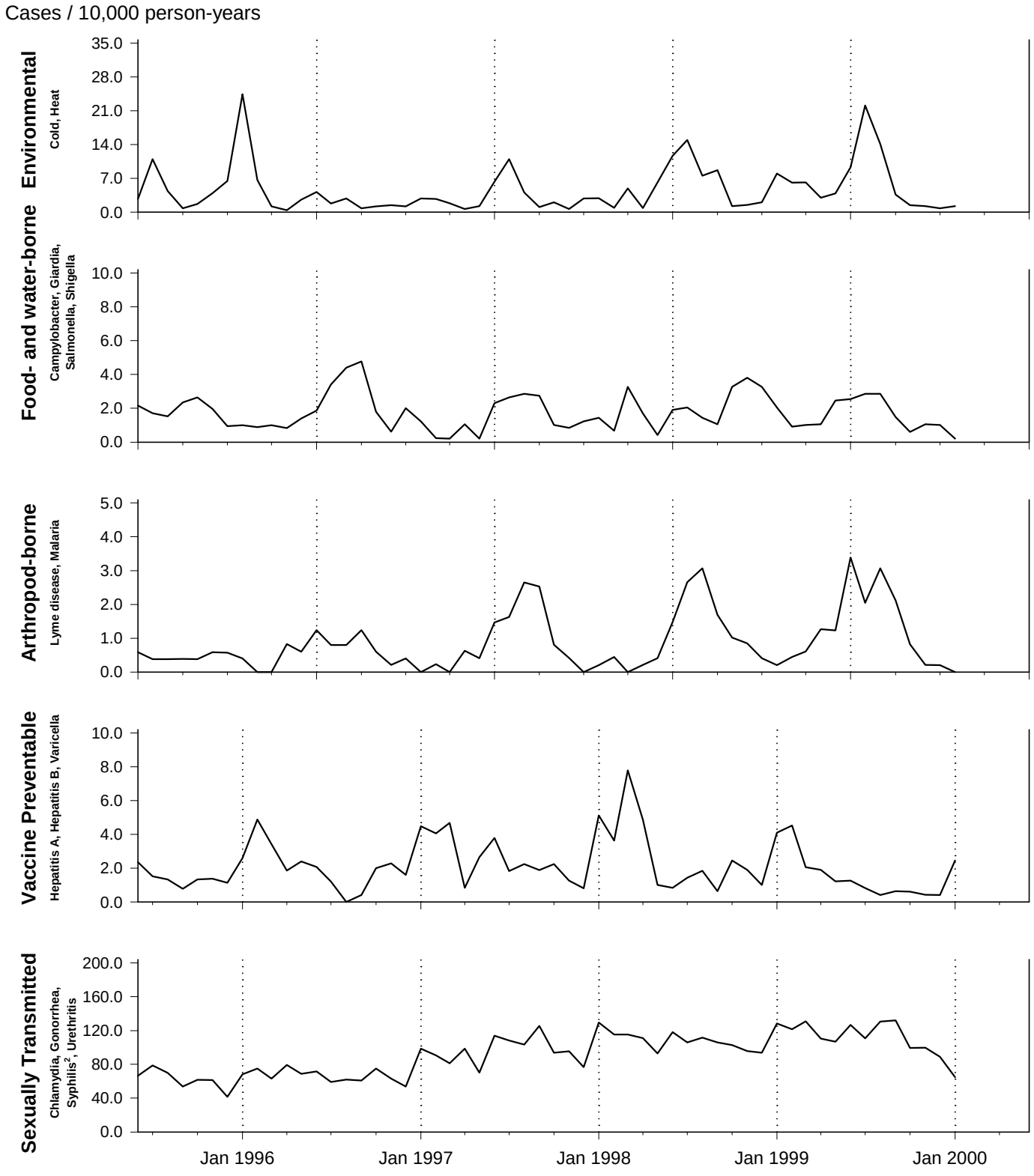
Arthropod-borne				Vaccine Preventable						Sexually Transmitted							
Lyme Disease		Malaria		Hepatitis A		Hepatitis B		Varicella		Chlamydia		Gonorrhea		Syphilis[4]		Urethritis	
Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000
1	-	1	-	-	-	-	-	2	-	13	-	2	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-
-	-	-	-	-	-	-	-	-	-	10	14	3	2	-	-	-	-
-	-	-	-	-	-	-	-	1	-	24	25	10	20	-	-	-	19
-	-	-	-	-	-	-	-	1	-	5	8	4	3	-	-	-	-
-	-	-	-	-	-	-	-	1	-	13	7	3	3	-	-	-	-
-	-	-	-	-	-	-	1	-	-	9	11	7	1	-	-	-	-
-	-	-	-	-	-	-	-	-	-	16	2	7	-	1	-	-	-
-	-	-	-	-	-	-	-	-	-	3	11	-	2	-	-	-	-
-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
-	-	-	-	-	1	-	-	-	-	-	10	-	4	-	-	-	-
-	-	-	-	-	-	1	-	2	1	8	14	9	5	-	-	1	-
-	-	-	-	-	-	-	-	-	-	36	19	6	1	-	-	8	-
-	-	-	-	-	-	-	-	-	-	5	19	3	6	-	-	4	3
-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
-	-	-	-	-	-	1	-	2	5	12	4	5	3	1	-	1	1
-	-	-	-	-	-	-	-	-	-	12	17	5	2	-	-	-	-
-	-	-	-	-	-	-	-	-	-	8	-	7	-	-	-	-	-
-	-	-	-	-	-	-	-	1	-	16	-	13	-	-	-	4	-
-	-	-	-	-	-	-	-	-	-	20	7	1	-	-	-	-	-
-	-	-	-	-	-	-	-	-	5	13	19	12	6	1	2	-	-
-	-	-	-	-	-	-	-	-	1	28	6	11	15	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-
-	-	-	-	-	-	-	-	2	-	5	19	7	13	-	-	19	18
-	-	-	-	-	-	-	-	-	-	49	39	4	7	-	-	12	13
-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	5	1	2	-	-	-	-	-
-	-	-	-	-	1	-	1	-	-	15	28	10	4	-	-	-	-
-	-	-	-	-	-	1	-	4	-	18	21	7	4	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-
1	**-**	**1**	**-**	**-**	**2**	**3**	**2**	**16**	**12**	**347**	**310**	**141**	**103**	**3**	**2**	**51**	**54**

4. Primary and Secondary.

Note: Completeness and timeliness of reporting varies by facility.

Source: Army Reportable Events System.

Figure I. Sentinel reportable events (grouped), active duty soldiers, June 1995-January 2000[1]



1. Events reported by February 7, 2000
2. Primary and Secondary

Source: Army Reportable Medical Events System

Surveillance Trends

Appendicitis and Appendectomies, Active Duty US Armed Forces, 1990-1998

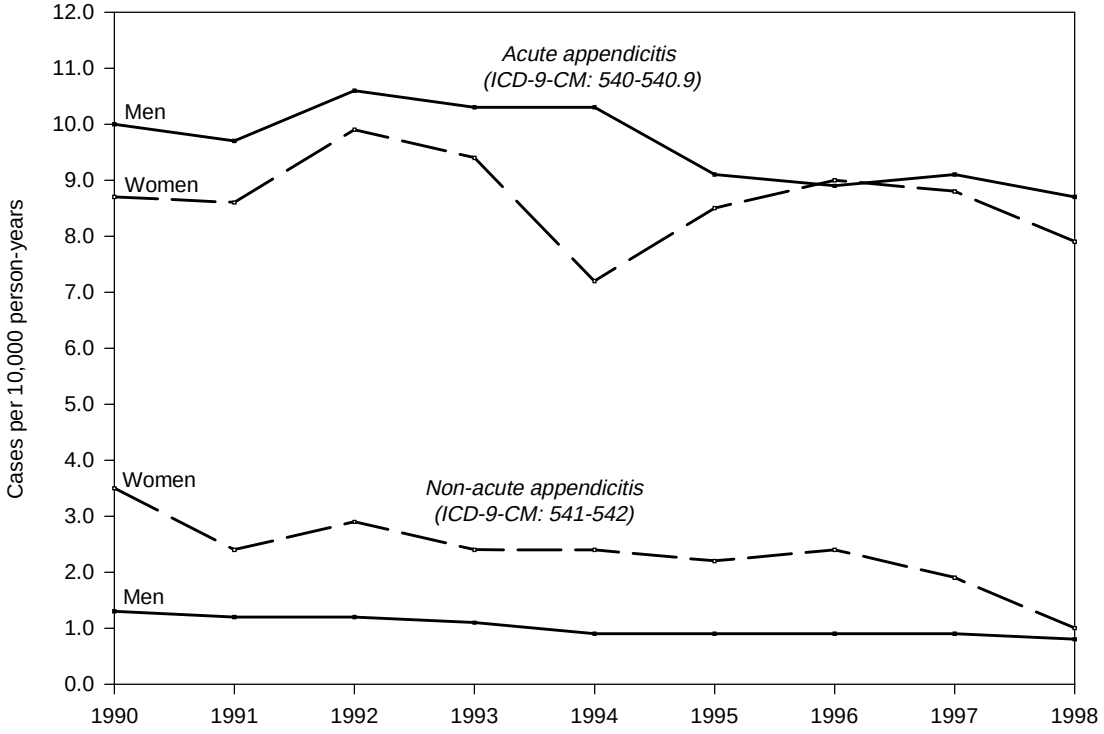
Appendectomies are among the most frequent major surgical procedures performed on young adults in the United States.[1] Because of an unpredictable and often sudden onset, appendicitis can disrupt military operations, particularly in remote locations and settings. Despite its frequency, however, the etiology of appendicitis remains poorly understood. This report summarizes rates, trends, and correlates of risk of appendicitis and appendectomies among military personnel between 1990 and 1998.

Methods. The surveillance population included military personnel who served in an active component of the US Armed Forces between 1990 and 1998. Case definitions included: hospitalizations with a diagnosis of "acute appendicitis" (codes 540-540.9, International Classification of Diseases, 9th revision, Clinical Modification [ICD-9-CM]); hospitalizations with a diagnosis of "non-acute appendicitis," including chronic, recurrent, relapsing, and subacute appendicitis (ICD-9-CM codes 541-542); hospitalizations with a standard indication for appendectomy, which for this report are called "standard appendectomy" (ICD-9-CM procedure codes: 47.0-47.09); or those with a medical procedure of "incidental appendectomy" (ICD-9-CM procedure codes: 47.1-47.19). Cases were identified by searching hospitalization records maintained in the Defense Medical Surveillance System. If servicemembers had multiple hospitalizations for appendicitis, only the first hospitalization was included for analysis.

Results. From 1990 to 1998, 16,304 service-members were hospitalized with appendicitis. Nearly 90% of these were for acute appendicitis. The crude incidence rate for appendicitis was 10.8 per 10,000 person-years.

During the surveillance period, annual rates of appendicitis declined by approximately 17% (figure 1). Rates of acute appendicitis declined by 14% among men and 8% among women. Although rates of acute appendicitis were higher among men than women, the opposite was true for rates of non-acute

Figure 1. Annual rates of appendicitis, active duty US Armed Forces, 1990-1998



appendicitis. Hospitalization rates for non-acute appendicitis declined by 50% among women and 36% among men.

To further control for effects of differences in socioeconomic status, appendicitis rates were calculated separately for enlisted servicemembers and officers (table 1). In general, incidence rates declined with increasing age. Age-adjusted rates were lower among officers, unmarried personnel, and Black and Asian enlisted servicemembers compared to their counterparts. Among enlisted personnel, Hispanics and Native Americans had the highest rates of appendicitis. There was little variation in appendicitis incidence by service.

Finally, among servicemembers who had appendectomies for standard indications—in contrast to appendectomies that were incidental to other procedures—approximately 83% of men but only 57% of women had final diagnoses of acute appendicitis (table 2). On the other hand, women were 11 times more likely than men to have incidental appendectomies. Thus, while men had a slightly higher rate of acute appendicitis, women had nearly twice the rate of appendectomies overall.

Editorial comment. Rates of appendicitis among US military personnel are generally comparable to those of civilians.[1] And, the decline in rates over

Table 1. Demographic characteristics of servicemembers with diagnoses of appendicitis, US Armed Forces, 1990-1998

Characteristic	Enlisted[1]			Officer[2]		
	Count	*Crude rate*[3]	*Age-adjusted rate*[3,4]	*Count*	*Crude rate*[3]	*Age-adjusted rate*[3,4]
Total	14,601	11.5	11.1	1,703	7.4	7.9
Gender						
Female	1,787	11.7	10.9	235	8.1	8.0
Male	12,814	11.5	11.1	1,468	7.3	7.9
Age						
< 20	1,743	15.8	-	0	0.0	-
20-24	6,279	14.2	-	191	10.5	-
25-29	3,159	11.3	-	453	8.9	-
30-34	1,879	9.2	-	427	8.1	-
35-39	1,121	7.3	-	299	6.5	-
> 39	420	5.4	-	333	5.4	-
Race/ethnicity						
American Indian/Alaskan Native	117	13.3	13.1	5	4.6	6.5
Asian/Pacific Islander	327	9.0	9.2	37	7.7	7.7
Black	2,127	7.6	7.5	86	5.0	6.0
Hispanic	954	13.5	12.8	63	10.2	8.6
White	10,815	12.7	12.1	1,494	7.6	8.1
Other	261	12.0	11.9	18	6.7	6.8
Marital status						
Single	6,276	12.0	9.7	411	7.7	6.9
Married	7,923	11.3	12.7	1,247	7.4	8.9
Other	402	9.3	12.0	45	6.3	9.7
Service						
Air Force	3,697	11.7	12.0	584	7.7	8.7
Army	4,822	11.1	10.6	582	7.2	7.6
Marine Corps	1,745	11.9	10.4	112	6.7	6.2
Navy	4,337	11.6	11.3	425	7.5	8.2

1. Includes ranks E1-E9.
2. Includes ranks O1-O10, W1-W5.
3. Rates calculated per 10,000 person-years.
4. Age-adjusted to all appendicitis cases among military personnel.

Table 2. Appendicitis incidence rates by gender, per 10,000 person-years, in relation to appendectomy, active duty US Armed Forces, 1990-1998

Diagnosis (ICD-9-CM code)[1]	Procedure (ICD-9-CM)[2]							
	Appendectomy (standard)		Appendectomy (incidental)		No appendectomy		Total	
	Men	Women	Men	Women	Men	Women	Men	Women
Acute appendicitis (540-540.9)	9.42	8.32	0.05	0.13	0.22	0.21	9.69	8.66
Non-acute appendicitis (541-542)	0.87	1.80	0.03	0.15	0.16	0.41	1.06	2.36
No appendicitis-related diagnosis	1.05	4.53	0.69	8.22	-	-	1.74	12.75
Total	11.34	14.65	0.77	8.50	0.38	0.62	12.49	23.77

1. Based on medical diagnosis codes (ICD-9-CM).
2. Based on medical procedure codes (ICD-9-CM).

time reflects similar trends in civilian populations in developed countries.[1-3] The reasons for the apparently widespread decline in appendicitis rates are unclear.

Demographic correlates of appendicitis risk among US military personnel are similar to those consistently reported in non-military populations. For example, in civilian populations, appendicitis rates invariably decline with age throughout adulthood[1,2,4-8] and are generally higher among men,[1,2,4-7,9] Hispanics,[9-11] and whites[2,9,12] relative to their counterparts.

Some investigators have hypothesized that the relationship between socioeconomic factors and acute appendicitis risk may account for variations in relation to race and ethnicity.[1,2,9] Unlike civilian populations, US military personnel are relatively homogeneous in regard to many socioeconomic factors, such as employment, housing, physical fitness, general health status, and access to medical care. Moreover, when military rank, a measure of socioeconomic status in terms of income and education level, is controlled for, racial and ethnic variations in risk persist. This finding suggests that racial and ethnic variations in appendicitis risk may be determined by genetic or other factors not related to socioeconomic status.

Finally, compared to men, women had a much higher rate of appendectomy but a lower rate of acute appendicitis. This finding is neither unique[1,5,7,13] nor surprising. Clinical manifestations of gynecological disease often mimic those of appendicitis[1,5,7,13] and thus lead to appendectomies. In addition, women are much more likely to have incidental appendectomies—for example, during obstetrical or gynecologic surgical procedures.

Data analysis and report by Abigail L. Garvey, MPH, Analysis Group, Army Medical Surveillance Activity.

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Surveillance Trends

Injury-related Morbidity in Relation to Military Occupations, Active Duty US Armed Forces, 1998-1999

Injuries among military personnel are significant sources of morbidity, mortality, disability, and lost duty time.[1-4] Occupational injuries are a major fraction of all injuries and a high priority for prevention efforts.[2,3,5-7] Occupations differ in relation to the knowledge and skills that define them. In addition, the physical and psychological hazards that are inherent to occupations also vary.[6] Analyses for this report were conducted to assess rates of injuries in relation to military occupations among military personnel.

Methods. All data were derived from electronic files maintained in the Defense Medical Surveillance System. The surveillance population included all US military personnel who served on active duty between October 1997 and September 1999. For this analysis, an injury was defined as a hospitalization or ambulatory visit for which the primary diagnosis specified an injury (codes 800-959 and 980-995, International Classification of Diseases, 9th Revision, Clinical Modification).

Occupational categories were based on the DoD Occupational Conversion Index, which groups occupations within the military services by similar tasks.[8] The index contains 64 officer and 170 enlisted occupational categories. Poisson regression was used to estimate the independent effects on injury risk of gender, age, service, grade, and calendar year. Rate comparisons across occupational groups were

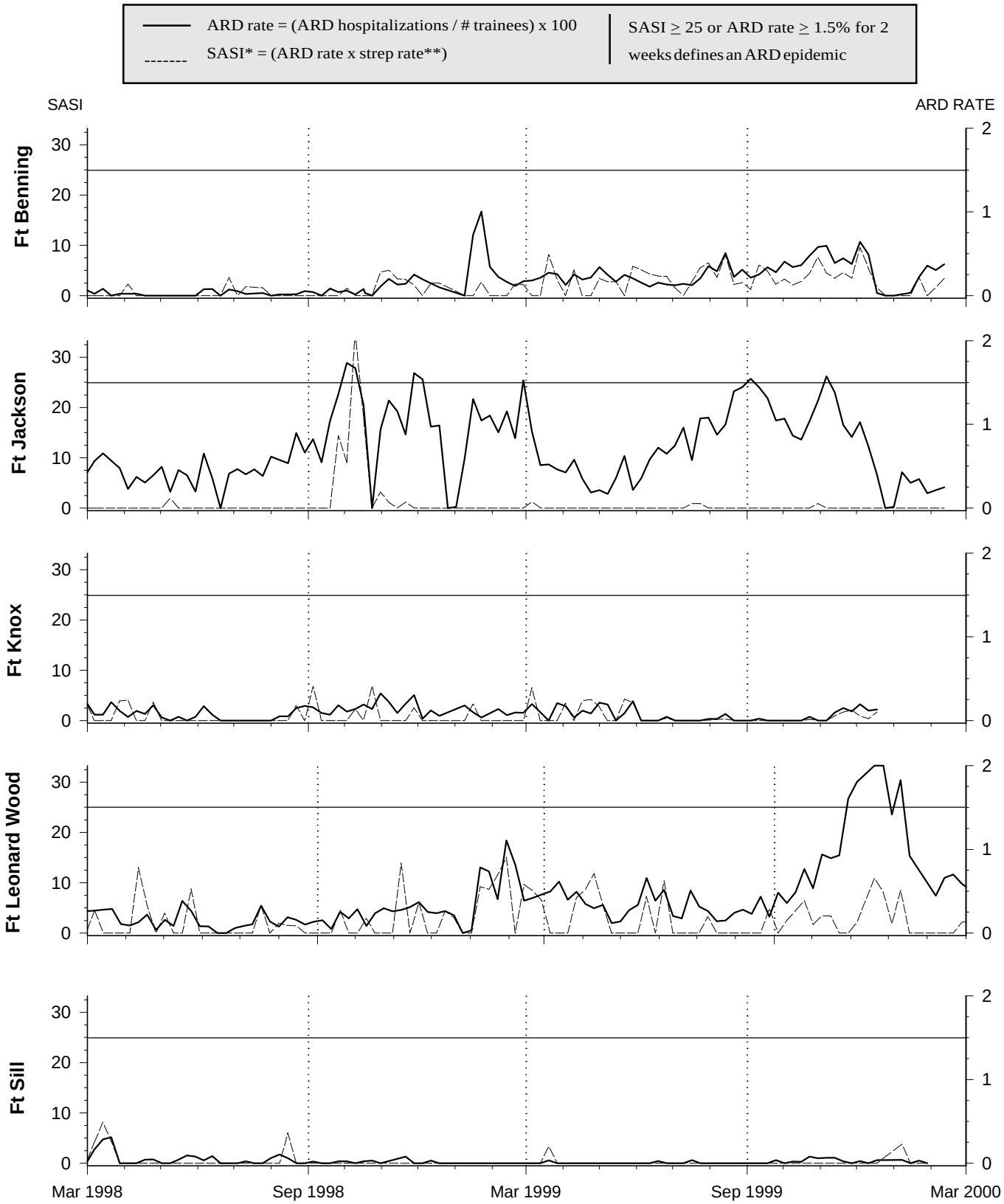
Continued on page 12

Table 1. Adjusted[1] rate ratios and 95% confidence intervals for injury-related morbidity, active duty US Armed Forces, 1998-1999

Characteristics	Person-years	Hospitalizations				Outpatient visits			
		N	Rate Ratio	Lower	Upper	N	Rate Ratio	Lower	Upper
Total	2,764,603	11,316	-	-	-	1,600,875	-	-	-
Gender									
Men	2,377,467	10,326	1.00	-	-	1,319,757	1.00	-	-
Women	387,136	990	0.65	0.61	0.70	281,118	1.28	1.28	1.29
Age									
17-19	229,486	1,207	1.69	1.56	1.84	167,523	1.13	1.12	1.13
20-24	836,761	4,621	1.80	1.69	1.91	539,672	1.11	1.10	1.11
25-34	1,033,853	3,861	1.38	1.30	1.46	578,190	1.05	1.05	1.06
35-65	664,503	1,627	1.00	-	-	315,490	1.00	-	-
Grade									
Enlisted	2,320,103	10,228	1.00	-	-	1,435,403	1.00	-	-
Officers	444,500	1,088	0.52	0.45	0.60	165,472	0.63	0.62	0.64
Service									
Army	949,824	5,091	1.00	-	-	744,215	1.00	-	-
Navy	746,226	2,446	0.71	0.66	0.75	320,101	0.54	0.54	0.55
Air Force	725,471	1,847	0.60	0.56	0.64	325,990	0.56	0.55	0.56
Marine Corps	343,082	1,932	0.96	0.91	1.02	210,569	0.75	0.74	0.75
Year									
1998	1,398,281	6,082	1.13	1.08	1.17	789,908	0.95	0.95	0.96
1999	1,366,322	5,234	1.00	-	-	810,967	1.00	-	-

1. Adjusted for gender, age, grade, service, and year.

Figure II. Acute respiratory disease (ARD) surveillance update
US Army initial entry training centers



* SASI (Strep ARD Surveillance Index) is a reliable predictor of serious strep-related morbidity

** Strep rate = (Group A beta-hemolytic strep(+) / # cultures) x 100

Continued from page 10

compared to the population characteristics of "infantrymen, general" for enlisted personnel and "ground and naval arms" for officers.

Demographics. During the surveillance period, there were 11,316 injury-related hospitalizations (crude rate: 4.1 per 1,000 person-years) and 1,600,875 injury-related outpatient visits (crude rate: 579.1 per 1,000 person-years).

The risk of injury-related hospitalization peaked in the 20-24 year old age group and rapidly declined thereafter. In contrast, outpatient risk was highest in the youngest age group (those younger than 20) and slowly declined thereafter. After adjustment, females were 28% more likely than males to have injury-related outpatient visits, but 35% less likely to have injury-related hospitalizations. Finally, injury-related hospitalization and ambulatory visit risks were higher in the Army than the other Services and among enlisted servicemembers compared to officers (table 1, page 10).

Enlisted occupations. Among enlisted personnel, the highest risks of injury-related hospitalizations were associated with the "combat" and "craftsworker" occupation categories (figure 1). The highest risks of injury-related outpatient visits were associated with the "non-occupational" and "craftsworker" occupation categories. Based on outpatient visits, of the 20 enlisted occupations with the highest adjusted injury risks, eight were in the "craftsworker" category (steelworker, woodworker, metal body repairer, utilities [general], electrician, construction equipment operator, construction [general], and lithographer [general]); four were in the "medical" category (diet therapy, physiology, surgery, and biomedical equipment maintenance/repair); three were in the "combat" category (small boat operator,

Figure 1. Adjusted relative risks of injury-related hospitalizations and outpatient visits, by major occupational categories, active duty US Armed Forces, 1998-1999

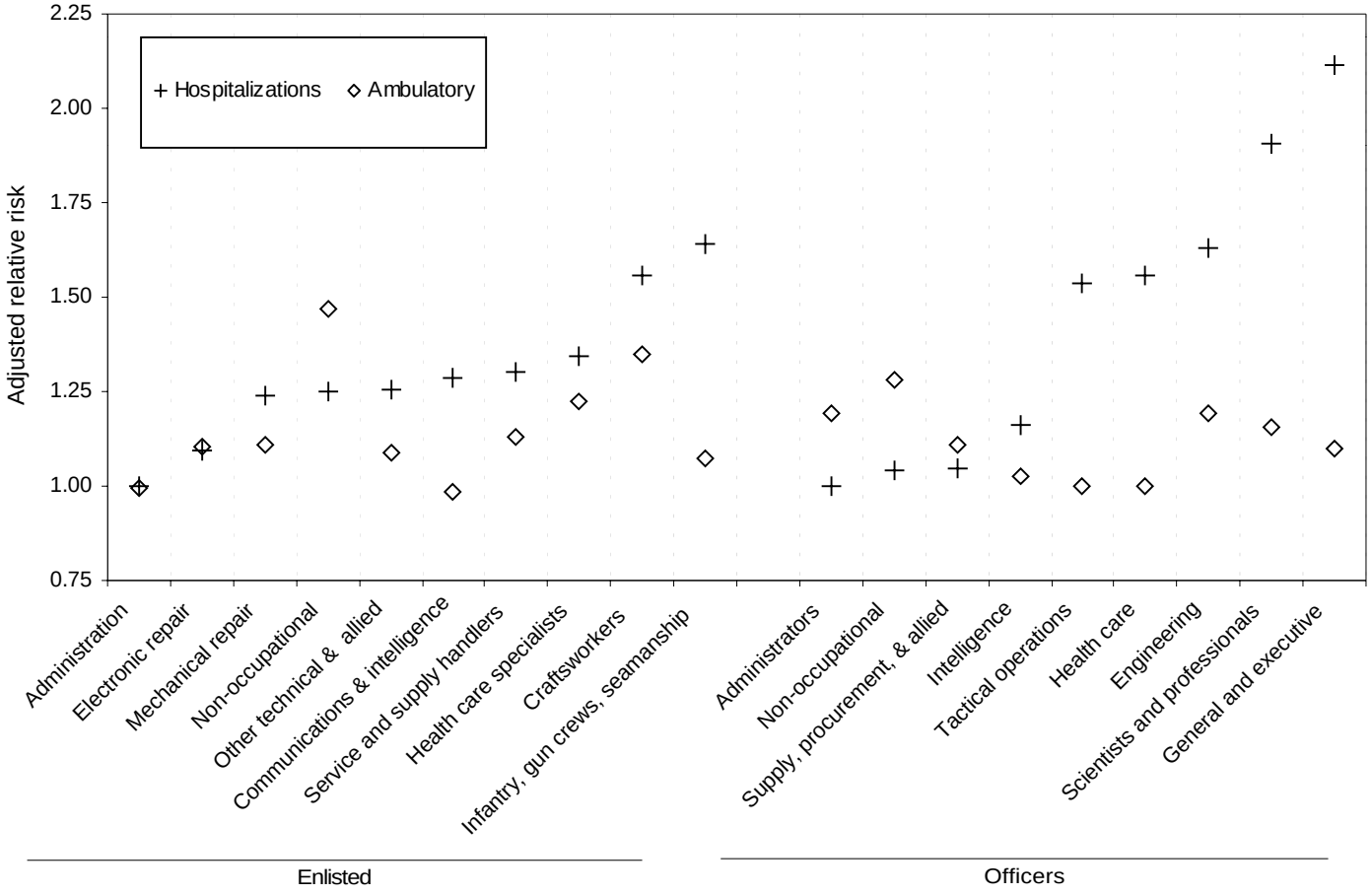


Table 2. Adjusted[1] rate ratios and 95% confidence intervals for injury-related outpatient visits, by occupation, active duty US Armed Forces, 1998-1999

Grade		Occupation	Person-years	Outpatient visits	Rate ratio	95 % Confidence interval	
						Lower	Upper
Enlisted[2]		Missile launch & support facility	1,154	802	1.82	1.70	1.95
		Students	1,122	1,096	1.73	1.63	1.84
		Small boat operators	2,595	2,324	1.67	1.60	1.74
		Diet therapy	2,164	2,183	1.67	1.60	1.74
		Steelworking	1,008	639	1.65	1.53	1.79
		Rocket artillery	6,556	7,617	1.62	1.59	1.66
		Physiology	1,050	694	1.60	1.49	1.73
		Forward area equipment support, general	10,530	8,425	1.57	1.53	1.60
		Woodworking	2,085	2,413	1.55	1.49	1.61
	Top 20	Not occupationally qualified, general	95,987	69,801	1.54	1.52	1.55
		Seamanship, general	28,983	18,630	1.53	1.50	1.56
		Metal body repair	2,325	2,298	1.52	1.46	1.58
		Surgery	6,683	5,474	1.50	1.46	1.54
		Utilities, general	15,837	10,294	1.50	1.47	1.53
		Warehousing & equipment handling	9,498	8,837	1.49	1.46	1.52
		Biomedical equipment maintenance/repair	3,170	2,477	1.48	1.43	1.54
		Electricians	8,029	5,268	1.48	1.44	1.52
		Construction equipment operation	11,142	10,203	1.47	1.44	1.50
		Construction, general	15,735	9,061	1.44	1.41	1.47
		Lithography, general	1,501	1,227	1.43	1.36	1.52
		Non-radio communications (visual)	2,779	928	0.84	0.79	0.90
		Nuclear power	21,961	6,589	0.80	0.78	0.82
	Lowest 5	1st SGT, SGTMAJ, Leading chiefs	10,949	4,427	0.75	0.73	0.77
		Language interrogation and interpretation	2,186	1,052	0.72	0.68	0.76
		Recruiting and counseling	24,497	6,589	0.54	0.52	0.55
Officers[3]		Automotive and allied	2,578	1,507	1.43	1.36	1.51
		Students	19,160	9,250	1.37	1.33	1.40
		Training administrators	1,209	499	1.34	1.22	1.46
		Chaplains	5,350	2,572	1.32	1.27	1.38
		Ship machinery	3,159	1,215	1.31	1.24	1.39
		Police	5,406	2,627	1.23	1.18	1.28
		Ordnance	3,378	1,633	1.23	1.17	1.29
		Health services administration officers	10,888	4,919	1.22	1.18	1.26
		Construction and utilities	7,430	3,046	1.22	1.17	1.26
	Top 20	Missile maintenance	1,443	614	1.21	1.11	1.31
		Nurses	20,949	9,975	1.17	1.13	1.20
		Information	1,609	657	1.16	1.08	1.26
		Physical scientists	2,654	983	1.14	1.07	1.22
		Manpower and personnel	9,523	4,173	1.14	1.10	1.18
		General administrators	5,112	1,866	1.13	1.08	1.19
		Communications and radar	19,174	8,019	1.13	1.10	1.16
		Legal	7,583	3,152	1.13	1.08	1.17
		Communications intelligence	2,728	1,036	1.11	1.04	1.18
		Other	1,841	608	1.11	1.02	1.20
		Counter-intelligence	1,715	718	1.10	1.02	1.19
		Missiles	1,021	345	0.87	0.79	0.97
		Aircraft crews	14,015	3,571	0.83	0.80	0.86
	Lowest 5	Research and development coordinators	2,434	751	0.83	0.77	0.89
		Fixed-wing fighter/bomber pilots	16,606	3,708	0.71	0.69	0.74
		Physicians	23,117	4,703	0.56	0.55	0.58

1. Adjusted for gender, age, grade, service, and year.

2. Adjusted to Infantry, general.

3. Adjusted to Ground & Naval Arms officers.

Note: Occupation with less than 1,000 person-years not included.

rocket artillery, and seamanship [general]); and two were in the "non-occupational" category (trainees and not occupationally qualified [general]) (table 2).

Officer occupations. Among officers, the highest risks of injury-related hospitalizations were associated with the "general officer and executives" and "scientist and professional" categories (figure 2). There was relatively little variation in injury-related outpatient visit risks across officer occupational categories (figure 1, page 12). Of the 20 specific officer occupations with the highest adjusted injury risks (based on outpatient visits), seven were in the "engineering and maintenance" category (automotive and allied, ship machinery, ordnance, construction and utilities, missile maintenance, communications and radar, and other) (table 2, page 13).

Editorial comment. In the US Armed Forces, injury risks among active duty servicemembers are highest among enlisted male soldiers younger than 25. Within this demographically defined high-risk subgroup, injury-related hospitalizations are most likely among trainees, tradesmen, and servicemembers with combat-specific occupations. However, it is likely that the major causes of injuries in these relatively high-risk occupational groups vary. Thus, the development of occupation-specific injury prevention measures may require detailed characterizations of relative frequencies, types, mechanisms, and circumstances of injuries.[3-6] For example, detailed field studies have characterized the nature, magnitudes, timing, and risk factors of injuries among basic trainees.[3] As a result, targeted prevention programs have been developed, tested, and in some cases incorporated into basic training programs.[3,9-11]

Data analysis and report by Samuel C. Washington, MPH, Analysis Group, Army Medical Surveillance Activity.

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The table on the following page is the corrected force strength table for September 1999. The incorrect table was included in the January 2000 issue of MSMR. We apologize for any inconvenience this may have caused.

–The Editors

Table S3. Active duty force strength by MTF, United States Army, September, 1999[1]

MTF/Post[2]	Males							Females							All
	< 20	20-24	25-29	30-34	35-39	>= 40	Total M	< 20	20-24	25-29	30-34	35-39	>= 40	Total F	
NORTH ATLANTIC RMC															
Walter Reed AMC, DC	108	3003	2102	1776	1925	3157	**12071**	37	830	743	505	549	623	**3287**	**15358**
Aberdeen Prov. Ground, MD	627	595	293	346	369	361	**2591**	55	95	75	61	43	42	**371**	**2962**
FT Belvoir, VA	9	194	280	304	350	400	**1537**	4	74	126	79	78	88	**449**	**1986**
FT Bragg, NC	1960	11549	8099	5987	4301	2358	**34254**	270	1738	1164	666	456	237	**4531**	**38785**
FT Drum, NY	578	3839	2412	1429	1088	522	**9868**	67	483	247	166	104	59	**1126**	**10994**
FT Eustis, VA	735	1745	1284	1011	945	803	**6523**	162	516	330	185	165	116	**1474**	**7997**
FT Knox, KY	2807	3337	1857	1460	1419	816	**11696**	43	240	209	145	117	69	**823**	**12519**
FT Lee, VA	828	1005	646	556	472	384	**3891**	433	481	235	159	132	92	**1532**	**5423**
FT Meade, MD	68	652	872	842	663	841	**3938**	31	275	297	221	174	140	**1138**	**5076**
West Point, NY	18	227	241	592	483	532	**2093**	2	61	63	97	75	68	**366**	**2459**
GREAT PLAINS RMC															
Brooke AMC	242	694	956	993	831	960	**4676**	172	374	401	348	288	302	**1885**	**6561**
Wm Beaumont AMC	491	2440	1864	1339	1240	1127	**8501**	137	678	444	215	189	167	**1830**	**10331**
FT Carson, CO	628	4575	3424	2036	1558	855	**13076**	140	716	456	218	166	89	**1785**	**14861**
FT Hood, TX	1680	13551	8881	5611	4054	2231	**36008**	385	2480	1541	907	665	362	**6340**	**42348**
FT Huachuca, AZ	432	1107	966	682	577	438	**4202**	109	370	214	116	107	107	**1023**	**5225**
FT Leavenworth, KS	37	273	237	556	830	600	**2533**	13	75	51	78	93	61	**371**	**2904**
FT Leonard Wood, MO	2828	1833	1232	1194	984	550	**8621**	1162	590	323	217	133	93	**2518**	**11139**
FT Polk, LA	393	2596	1632	1311	814	371	**7117**	78	462	266	152	86	68	**1112**	**8229**
FT Riley, KS	570	3664	2236	1360	941	501	**9272**	55	431	249	147	101	57	**1040**	**10312**
FT Sill, OK	2880	3922	2387	1643	1274	764	**12870**	552	559	364	218	135	68	**1896**	**14766**
SOUTHEAST RMC															
Eisenhower AMC	1156	1943	1486	1148	1148	1180	**8061**	240	582	459	331	299	251	**2162**	**10223**
FT Benning, GA	6137	5278	3430	2122	1481	762	**19210**	84	536	374	235	181	75	**1485**	**20695**
FT Campbell, KY	1179	7556	5558	3521	2446	1177	**21437**	187	1075	706	369	227	102	**2666**	**24103**
FT Jackson, SC	2756	1634	905	910	755	468	**7428**	1935	990	473	340	193	96	**4027**	**11455**
FT Rucker, AL	138	746	1001	613	507	443	**3448**	63	193	146	71	49	33	**555**	**4003**
FT Stewart, GA	912	6290	4155	2450	1868	963	**16638**	173	1096	671	391	243	147	**2721**	**19359**
WESTERN RMC															
Madigan AMC	762	4894	3491	2349	1895	1252	**14643**	151	833	590	327	240	198	**2339**	**16982**
FT Irwin, CA	179	1423	976	719	545	275	**4117**	31	192	138	75	55	23	**514**	**4631**
FT Wainwright, AK	332	1852	1627	827	545	305	**5488**	54	325	244	137	110	53	**923**	**6411**
OTHER LOCATIONS															
Tripler AMC	630	4007	3418	1979	1457	881	**12372**	121	836	712	382	266	193	**2510**	**14882**
Europe	1555	14215	13321	8422	6101	3971	**47585**	405	2890	2302	1317	943	576	**8433**	**56018**
Korea	1873	6508	5077	3666	3015	1977	**22116**	338	1197	907	628	480	286	**3836**	**25952**
Other/Unknown	1153	2265	3456	6167	5829	4031	**22901**	344	593	673	724	635	444	**3413**	**26327**
Total	**36855**	**119727**	**90137**	**66277**	**53158**	**36685**	**402839**[§]	**8059**	**22940**	**16250**	**10289**	**7826**	**5437**	**70801**[§]	**473653**[§]

1. Based on duty zip code. Does not account for TDY.
2. Includes any subordinate catchment areas not listed separately.

§ Includes unknown age groups and unknown gender.

Source: Defense Manpower Data Center.

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